

# Human Brain Microvascular Endothelial Cells (HBMVEC)

**SKU: 10HU-051**

## Product Description

Human brain microvascular endothelial cells (HBMVEC) are the major component of the blood-brain barrier (BBB), which protects the brain from toxins and immune cells infiltration through mechanisms involving paracellular, transcellular pathways, transporters, and extracellular matrix proteins. <sup>[1]</sup> Unlike peripheral endothelial cells, HBMVECs are characterized by the absence of fenestrations, reduced pinocytic activity, tight junction connections and a high density of mitochondria indicative of their elevated metabolic demands. <sup>[2]</sup> Similar to peripheral endothelial cells, HBMVECs express, or can be induced to express, cell adhesion molecules on their surface that regulate the extravasation of leukocytes into the brain. HBMVECs have been widely used for studying the molecular and cellular function of blood-brain barrier. <sup>[3]</sup>

## Product Details

**Catalog Number:** 10HU-051

**Organism:** *Homo Sapiens*, Human

**Cell Type:** Endothelial Cells

**Tissue:** Human Brain

**Disease:** Normal

**Package Size:** 0.5 x 10<sup>6</sup> cells/vial

**Passage Number:** P2

**Growth Properties:** Adherent

## Storage Conditions & Shipment

**Product Format/Shipped:** Cryopreserved

**Storage:** Liquid Nitrogen

## PRODUCT SHEET

### For Research Use Only

iXCells Biotechnologies USA, Inc.

United States

[www.ixcellsbiotech.com](http://www.ixcellsbiotech.com)

### Customer Support

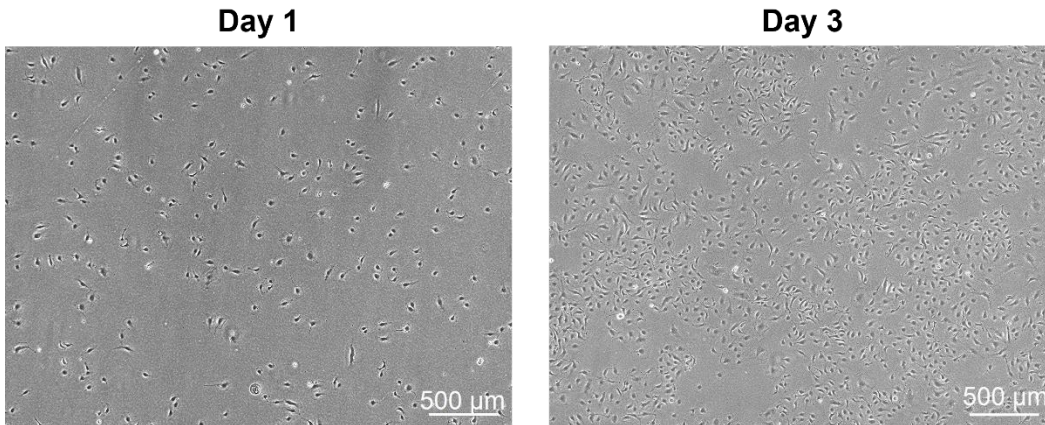
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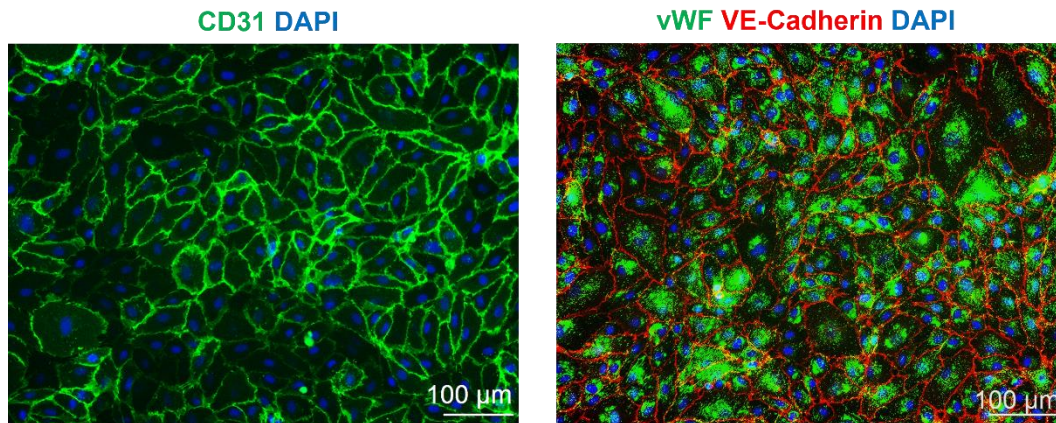
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## Overview of Human Brain Microvascular Endothelial Cells (HBMVEC)

**iXCells Biotechnologies** provides high quality HBMVEC, which are isolated from human brain and cryopreserved at P2, with  $\geq 0.5$  million cells in each vial. These HBMVECs express von Willebrand Factor (vWF), CD31 (PECAM-1) and VE-Cadherin. Their functionality has been tested through the Dil-Ac-LDL uptake (data not shown). They are negative for HIV-1, HBV, HCV, mycoplasma, bacteria, yeast, or fungi and can be further expanded for no more than 3 passages under the conditions suggested by iXCells Biotechnologies. Further expansion may decrease the purity.



**Figure 1.** Phase contrast images of Human Brain Microvascular Endothelial Cells (HBMVEC). The cells were recovered and seeded at 10,000 cells/cm<sup>2</sup> following iXCells' protocol. The images were taken at the indicated time post recovery.



**Figure 2.** Immunofluorescence staining of HBMVEC using antibodies against CD31 (green), VE-Cadherin (red) and vWF (green), with nuclei counterstained by DAPI (blue).

## QuickStart Guide – Protocols

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**NOTE:** IXCELLS CELLS MUST BE CULTURED IN A 37°C, 5% CO<sub>2</sub> INCUBATOR. CELLS ARE WARRANTED ONLY WHEN USING IXCELLS -RECOMMENDED MEDIA AND REAGENTS AND FOLLOWING THE PROVIDED PROTOCOLS.

### Cell Culture Reagents

1. Complete culture medium: Endothelial Cell Growth Medium, iXCells, Cat# MD-0010.
2. Trypsin: 0.05% Trypsin, Cytiva, Cat# SH30236.02.
3. DPBS: DPBS without Calcium, Magnesium, Cytiva, Cat# SH30028.02.
4. Coating Material: Collagen I, Corning, Cat# 354236.

### Plate Coating

1. Coat the culture vessel with Collagen I (30 µg/mL) in a 37°C incubator for one hour.
2. Wash the vessel 3 times with DPBS. The vessel is now ready for cell culture.

### Cell Thawing Procedure

1. Upon receipt of the frozen cells, it is recommended to thaw the cells and initiate the culture immediately to retain the highest cell viability.
2. To thaw the cells, put the vial in a 37°C water bath with gentle agitation for 1-2 minutes. Keep the cap out of water to minimize the risk of contamination.
3. Pipette the cells into a 15 mL conical tube with 5 mL fresh complete culture medium.  
**Note:** Please prepare the complete culture medium following the manufacturer's instruction.
4. Centrifuge at ~350 g for 5 minutes at room temperature.
5. Remove the supernatant and resuspend the cells in fresh complete culture medium.
6. Seed the cells in desired pre-coated culture vessel at 5,000-10,000 cells/cm<sup>2</sup>. Change the medium every other day until cells reach 80-90% confluence.

**Safety Precaution:** It is highly recommended that protective gloves and clothing be used when handling frozen vials.

### Subculture Procedure

1. When cells reach ~80-90% confluence, remove the medium, and wash once with sterile DPBS (e.g. 5 mL for one T75 flask).
2. Add 3 mL of 0.05% Trypsin-EDTA to the flask and incubate for 5 minutes at 37°C. Neutralize the enzyme by adding 2-3 volumes of cell culture medium.
3. Centrifuge ~350 g for 5 minutes and resuspend the cells in desired volume of medium.
4. Seed the cells in the new culture vessels at 5,000-10,000 cells/cm<sup>2</sup>. Change the medium every other day until cells reach 80-90% confluence.

**Note:** Penicillin-streptomycin, antibiotics and antimycotics, or other antibiotics are optional for the culture media. In-house tests at iXCells were performed under antibiotics-free conditions for >=3 days by following the recommended protocol, and no bacterial or fungal contamination were observed during the cell culture period.

## References

- [1] Abbott, N. J., Patabendige, A. A., Dolman, D. E., Yusof, S. R., & Begley, D. J. (2010). Structure and function of the blood-brain barrier. *Neurobiology of disease*, 37(1), 13–25.
- [2] Yang, C., Hawkins, K. E., Doré, S., & Candelario-Jalil, E. (2019). Neuroinflammatory mechanisms of blood-brain barrier damage in ischemic stroke. *American journal of physiology. Cell physiology*, 316(2), C135–C153.
- [3] Godinho-Pereira, J., Garcia, A. R., Figueira, I., Malhó, R., & Brito, M. A. (2021). Behind Brain Metastases Formation: Cellular and Molecular Alterations and Blood-Brain Barrier Disruption. *International journal of molecular sciences*, 22(13), 7057.

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